

BULLETIN

The energy and planning resource for Western utilities

CUSTOMER INPUT GUIDES OPPD
IN RESHAPING GENERATION PORTFOLIO

When the customers of Omaha Public Power District (OPPD) talk, the utility listens. More specifically, before making a big move regarding its future, the utility first sought out the opinion of its customer-owners.

The OPPD board of directors recently approved a proactive plan that dramatically reshapes the utility's future generation portfolio by retiring three of the oldest coal-fired generating units at its North Omaha Station. The plan is intended to position the utility for compliance with future government regulations to reduce greenhouse gas emissions while preserving its ability to meet customer demand for electricity.

The decision was preceded by an extensive public outreach process, the first of its kind—but not the last—for OPPD. “Our customers have let us know that they want more of a voice in major decisions, especially those involving our coal plants and pending environmental legislation,” explained



OPPD customer-owners attended public meetings to offer comment on the future makeup of their utility's resource portfolio. OPPD hosted 10 meetings as part of a public process to get input from their ratepayers before making a final decision. (Photo by Omaha Public Power District)

Senior Media Specialist Mike Jones. “We will definitely be using the process again to make decisions on issues like renewable energy and rate changes.”

BEST-LAID PLAN

Retiring the three units at North Omaha by 2016 will significantly reduce emissions and bring OPPD into compliance with the Environmental Protection Agency's Mercury and Air Toxics Standard. The two remaining generating units will remain on coal but be retrofitted with additional emission controls, and, by 2023, be converted to natural gas. Under the plan, Nebraska City Station Unit 1 will also be retrofitted in 2016.

The plan also calls for the district to reduce its load by 300 megawatts

(MW) through customer participation in demand side management (DSM), a strategy that has strong customer support. “The level of interest in DSM and energy-efficiency programs may have been the biggest surprise of the stakeholder process,” Jones observed. “Our customers said they like the programs OPPD already offers but they want to see us do more, including offering more incentives and providing more education on how customers can save energy.”

Customers made it clear during the stakeholder process that they understood changes to comply with new environmental regulations could lead to higher energy costs. The approved measure is projected to cost

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customers somewhere between zero to two percent over a 20-year period, well within ratepayers' comfort zone. OPPD President Gary Gates expressed confidence that the plan carries forward the district's commitment to affordability, reliability and environmental sensitivity. "It also continues to provide a diverse generation portfolio, which customers also said was important to them," he said.

BUILDING THE PERFECT PROCESS

Resource planning is hard enough, and actively engaging consumers in the process adds a layer of difficulty. It took time and extensive planning for OPPD to design a public outreach process that gave customers the voice they wanted in the board's ultimate decision.

In late 2012, the board tasked the corporate communications and marketing department, led by Division Manager Lisa Olson, with organizing the stakeholder process. "It was an organization-wide effort because the decisions being made were going to have such a wide-reaching effect, on OPPD staff as well as its customers," said Jones.



OPPD streamed four of its public meetings live on its website so customers who could not make it to the meetings had the opportunity to submit questions to the utility executives. (Photo courtesy of Omaha Public Power District)

Starting with community and advocacy groups that had already approached OPPD about wanting a public process, the outreach team invited the public to a series of 10 open house meetings. Announcements appeared in local newspapers, the OPPD newsletter, on the website and in the district's social media forums. OPPD sent news releases to local media and made representatives available for interviews. The outreach team also attended community events where they could talk to customers who might not be aware of the upcoming meetings. "If you can think of an avenue of communication, we used it," Jones recalled. "The most important piece of advice for utilities launching their own public process is to keep the message in front of your customers. Do whatever it takes to encourage their participation."

GO TIME

The meetings began in February and were held at venues throughout OPPD territory. Representatives also attended community meetings and

meetings of nonprofit organizations. Turnouts ran the gamut from a dozen or so attendees to as many as 50, as did the level of engagement. Groups like the Sierra Club and Nebraska Wildlife had definite opinions they wanted to share, while many individual customers just wanted to learn more. "There were people who just wanted to let us know that they didn't want a lot of change," Jones noted. "It was critical to the process that everyone who participated felt like we were listening."

Customers who were unable to make it to one of the meetings could share their input on a website, OPPDListens.com. Launched in March, OPPDListens functioned as an online meeting, walking visitors through the issues and options and letting them leave their own comments. About 500 to 600 visitors left comments on the website.

In addition to having an online forum, OPPD customers were randomly selected for a series of focus groups

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ENERGY SERVICES BULLETIN

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Editor: Kevon Storie
Designer: Grant Kuhn

ENERGY SERVICES
Western Area Power Administration



TECHNOLOGY SPOTLIGHT:

SAVING ENERGY WITH CARBON DIOXIDE

Carbon dioxide, the stuff we associate with exacerbating climate change, can actually help prevent climate change and save a lot of energy when used in the right technologies for appropriate applications, such as washing machines and water heaters.

CO₂ WASHING MACHINES

Commercial and industrial washing machines may be the last place you would expect to use CO₂. This non-flammable, non-toxic, naturally occurring gas can be pressurized to become a liquid and used to clean laundry. In liquid form, CO₂ has low viscosity and acts as a surfactant, which allows proprietary detergent formula to penetrate the fabric better than detergent in hot water. Liquid CO₂ also disinfects, making it a good option for hospitals and industries with clean rooms, and a single machine can clean 100 to 200 pounds of laundry per hour.

Once the clothes are clean, the CO₂ is depressurized so it flashes back into a gas and the laundry is instantly dry. No dryer is needed, which greatly reduces energy use. The liquid gas does not harm delicate fabrics, and clothing lasts longer because high-temperature water and machine agitation are not needed. After each wash, the CO₂ is captured, filtered, distilled, re-pressurized and reused.

CO₂ washers are appropriate for large, centralized cleaning operations, such as hotels, hospitals, uniform cleaning companies, prisons, nursing homes, textile plants and industries with clean rooms.

According to a recent study by the California Energy Commission (CEC), CO₂ washing machines achieved a 60-percent reduction in electrical energy use and a 46-percent reduction in natural gas use when compared with water-based cleaning. Eliminating

water use completely provides users with additional savings. The CEC estimates that 8,000 facilities in California would be good candidates for this technology. Just a five-percent market penetration in that one state could save 264 million kilowatt-hours, 20 million therms, and more than 600 million gallons of water, according to the CEC. The bottom line is that an investment in CO₂ washers could have a two- to four-year payback.

CO₂ HEAT PUMP WATER HEATERS

Another up-and-coming CO₂ technology is the CO₂ heat pump water heater (HPWH). Similar to the HPWHs available at home improvement stores, CO₂ models are even more efficient at generating hot water for washing and space heating (with radiant floor, radiators, etc.).

Like CO₂ washing machines, these water heaters compress CO₂ until it becomes a liquid (at about 1,400 pounds per square inch). CO₂ is more efficient than conventional refrigerants, and it has 1,000 times less effect on climate change.

The water tank is larger than a conventional water heater—usually about 80 gallons—allowing for some stratification of the water. The coolest water at the bottom of the tank is piped to the compressor for reheating, which optimizes efficiency. The water temperature is also higher than with a conventional water heater—about 150°F. The higher temperature, combined with a bigger tank, means that more people can take showers before the hot water runs out, even if the system turns off for a while during a utility's peak demand reduction program.

In the split system version, the compressor and condensing fan are in a separate unit outside, which eliminates noise inside. The variable-speed drives



About 32 dry cleaning companies in the country are currently cleaning with the Glacier liquid CO₂ system supplied by Solvair of Naperville, Illinois. The system uses no water and disinfects clothes completely. (Photo by Solvair Cleaning Technologies)

on the fan, compressor and pump (the key to making this equipment so efficient) reduce the noise from the outside unit even more, meaning CO₂ HPWHs are usually much quieter than conventional models. This also means the unit does not draw conditioned air from inside the home or small commercial building to heat the water, as un-ducted, single-unit HPWHs do. A smaller (40 gallon), single-unit, ducted CO₂ HPWH may be available in the U.S. in the future. Like the larger split-system version, it benefits from CO₂ refrigerant, variable speed and use of outside air.

Even with a bigger tank, hotter water, a highly pressurized refrigerant and a compressor that pulls heat out of outside air during the winter, this technology uses less energy than conventional HPWHs: its efficiency is about 50 percent greater than conventional HPWHs, which are about twice as efficient as a conventional electric water heater. The delivery

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rate, measured by the number of back-to-back showers you can take without running out of hot water, is also about 50 percent better than a conventional HPWH. CO2 HPWHs can be especially efficient when used in applications such as a commercial kitchen where the “outside” unit can be mounted high on a wall to provide hot water and cool air.

These are not just manufacturers’ claims, either; these are independent test results from a university and a national lab.

The field study Washington State University (WSU) Energy Program conducted indicates that the systems can provide both space and water heat for highly energy-efficient homes. The WSU Energy Program is working with the Next Step Home Program of the Northwest Energy Efficiency Alliance to test this concept in a number of homes. Pacific Northwest National Laboratory is documenting the equipment’s potential to help reduce peak load demand.

Right now, CO2 HPWHs are available in the U.S. only in larger sizes for commercial and industrial applications. But the largest manufacturer expects to roll out their residential version in the U.S. in early 2015. The technology has been used in Asia, Europe and Australia for many years. Learn more about these and other new and emerging technologies from Energy Efficiency Emerging Technologies. ⚡

Generation portfolio

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set up by the consulting firm Market Strategies International . Participants from the residential and commercial sectors weighed in on the implications of future generation options and portfolios.

Working with engineering consultant Black & Veatch , OPPD compiled the results from the meetings, the website and the focus groups into a preliminary report it presented to customers in April. The goal, according to Jones, was to make the process as transparent as possible. “We wanted customers to see what their neighbors were saying and to understand that, whatever the final decision was, they were driving it,” he said.

The outreach team culled the top five options customers preferred and presented a report to the board. It was up to OPPD management to reconcile the

board’s concerns with the customer preferences, and release the final recommendations in May.

POSITIVE OUTCOME

At the end of the careful process, OPPD had a plan that gives the utility the flexibility to balance customers’ concern for the environment with their need for reliable, affordable power. The utility also had another tool for getting customer buy-in on major decisions in the future. “All in all, we are pretty happy with the stakeholder process,” Jones acknowledged. “We may do some fine tuning, but it worked as we hoped.”

The key to that success, he added, is sincerity. “When you give people the chance to say what is on their minds, you have to take it seriously,” Jones said. “If they think it is just for show, you will lose their trust.”

But then, Omaha Public Power District has already established its reputation for being in touch with its customer-owners, and it showed in the input received during the public process. “It turns out that the board and the customers are pretty much on the same page about the direction OPPD needs to go,” observed Jones. “That is gratifying to know. You can be going down a path that you think is what your customers want and find out that you are out of touch with them. That was not the case this time.”

For more information about the implementation and the value of a formal public outreach process, see Nebraska Public Power District Customer Meeting on Energy Alternatives: Summary of Results . Western worked with Nebraska Public Power district to produce this report. ⚡

DOE INITIATIVE CONNECTS MANUFACTURERS, NO-COST ENERGY AUDITS

Most industrial customers could use some help trimming or managing their energy use, but small utilities serving those businesses often have their hands full just dealing with the day-to-day business of keeping the lights on. Industrial Assessment Centers (IACs), set up by the Energy Department's Advanced Manufacturing Office, may have the solution you and your large key accounts need.

IACs show small- and medium-sized manufacturers how to improve productivity, reduce waste and save energy. These steps can go a long way toward boosting the competitiveness of commercial and industrial customers. Through IAC offices, local university engineering departments and students work with manufacturers to identify energy-efficiency upgrade opportunities in their facilities.

Teams of faculty and students perform assessments at no cost to the plants. The assessment begins with a one- or two-day site visit, during which engineering measurements are taken. The team then analyzes their results to make specific recommendations. Within a couple of months, the manufacturer receives a report from the team detailing the analysis, findings and recommendations, including estimates of costs, performance and payback times.

IAC recommendations have averaged about \$55,000 in potential annual savings for each manufacturer. IAC assessments are intended for manufacturers with Standard Industrial Classification (SIC) codes 20-39 located within 150 miles of a host campus. The business must have gross annual sales below \$100 million, fewer than 500 employees at the plant site and annual energy bills



more than \$100,000 and less than \$2 million.

There are four IACs located in Western's territory:

- Colorado State University
- Iowa State University
- San Diego State University
- San Francisco State University

In addition to providing technical assistance to manufacturers, the program partner Rutgers University Center for Advanced Energy Systems maintains a massive database of IAC assessment summaries. Cases can be searched by year, SIC code, NAICS (North American Industry Classification System) code, energy

cost, state, products or center. Each record describes the plant (but not the name), and includes a list of recommended measures with the estimated cost and saving of each.

Visitors can also find a description of the assessment process the industrial plant can expect. Additional resources, including a training manual, a self-assessment workbook for small manufacturers and case studies are also available.

Source: Energy Experts, 7/9/14 ⚡

DOE EFFICIENCY STANDARDS TAKE ON SURPRISE ENERGY HOG

A little-known home energy hog is the target of new efficiency standards the Department of Energy (DOE) issued recently. The new standards cut the cost of powering furnace fans by about 40 percent, while delivering improved comfort. Furnace fans, which circulate heated and cooled air throughout a home, consume more than twice the electricity in a year as a typical new refrigerator.

Most furnace fans are part of a furnace, but in homes with central air conditioning, the fan works year-round, circulating cooled air during the summer and heated air during the winter. Furnace fans consume about 1,000 kilowatt-hours (kWh) per year, or almost 10 percent of the average U.S. home's total electricity use.

HIDDEN HOG

According to Trends in Energy Efficiency in 2012, by the Association of Home Appliance Manufacturers, that is almost 400 kWh more annually than room air conditioners. The difference in energy consumption is even greater when furnace fans are compared to refrigerators and dishwashers, which the report also did. But the furnace fan is hidden from consumers inside the furnace.

Replacing the permanent split capacitor (PSC) motor that typically drives furnace fans with a brushless permanent magnet (BPM) motor can achieve big energy savings. The BPM motor meets the new performance standards, is much more efficient and is commercially available today.

DOE estimates that the new standards, which take effect in 2019, will save an average consumer as much as \$500 over the life of a furnace fan. On a national level, the standards will reduce electricity consumption by about 500 billion kWh over 30 years of sales, saving businesses and consumers more than \$29 billion.

MORE COMFORT, LESS CO₂

The American Council for an Energy



Efficient Economy notes that the furnace fan standards can also improve comfort in two ways. First, the more efficient motors do a better job of providing sufficient airflow to circulate the conditioned air.

Second, the new standards are based on the use of multi-stage controls for furnaces, rather than single-stage, "on" or "off" controls. Single-stage furnaces shut off once the desired room temperature is reached, and turn back on again once the temperature drops below a set point. Multi-stage or modulating furnaces, on the other hand, allow the furnace to better match the actual demand for heat by providing two or more levels of heat output (high and low, for example). Operating continuously

rather than turning on and off not only reduces fan energy consumption, but also improves comfort by reducing temperature swings.

The energy savings from the new standards for furnace fans also cuts carbon dioxide (CO₂) emissions by 34 million metric tons over 11 years. President Obama's goal is to reduce CO₂ emissions by 3 billion metric tons by 2030 through efficiency standards. To date, efficiency standards adopted during the Obama administration will reduce CO₂ emissions by more than 2 billion metric tons, save consumers money, increase comfort and help protect the environment all at the same time.

Source: American Council for an Energy Efficient Economy, 6/24 ⚡

STILL TIME TO REGISTER FOR NATIONAL GEOTHERMAL SUMMIT

AUG. 5-6 GRAND SIERRA RESORT

Don't miss this opportunity to meet and network with industry professionals and policymakers on issues and topics affecting geothermal development across the country.

Cohosted by the Geothermal Energy Association and Ormat Technologies, Inc., the fourth annual National Geothermal

Summit will cover a range of topics including renewable portfolio standard policies, new U.S. codes and standards for geothermal energy, leasing and permitting improvements and the outlook for new renewable power procurements in the Western states. Check out the agenda.

Register today to sponsor, attend or exhibit at the National Geothermal Summit. Please contact Kathy Kent Schott for information about Summit sponsorships. To schedule an interview or request press credentials, please contact Shawna McGregor at The Rosen Group, 917-971-7852. ⚡

AWEA STATE WIND ENERGY FORUM COMES TO COLORADO

OCT. 1, 2014 UNIVERSITY OF DENVER, COLORADO

The American Wind Energy Association is inviting regional stakeholders to participate in the 2014 Colorado Wind Energy Forum on Oct. 1, 2014, at the University of Denver.

Colorado is on the forefront of wind energy expansion, making it an ideal location for a state-level wind forum. It consistently ranks among the top 10 wind energy states in the country, with installed wind capacity of more than 2,300 MW. In economic terms, that represents an impressive \$4 billion in wind investments. At this scale, wind is increasingly cost-competitive, and utilities like Xcel are purchasing more wind power in Colorado to lock in fixed, low-price electricity to save consumers money.

Attendees at the second annual forum can look forward to exploring the current wind market landscape, business opportunities, environmental and political challenges and economic benefits related to wind energy in Colorado. Speakers will cover new developments and different perspectives including EPA's release of the draft carbon regulations; the implementation of SB252, which expanded the state's renewable energy standard; and the development of the U.S. Department of Energy's Wind Vision and its implications for Colorado.

The lunch table topics, last year's most popular session, gives participants the opportunity to focus on the details in smaller groups. Experts will lead discussions on topics ranging from

wind basics and myths to state and national policy to the latest technology developments.

A reception immediately following the forum will continue the dialogue, foster networking and bring partners together to further Colorado's wind future.

The conference agenda is designed to appeal to stakeholders from all facets of the wind industry. Policy makers, manufacturers, community leaders, financial professionals and power providers should plan to commit one day to acquiring relevant, current, pivotal information related to Colorado's wind energy landscape. Register online, or contact Larry Flowers, 720-635-4741, for more information. Sponsorship opportunities are also available. ⚡